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"To the solid ground
Of Nature trusts the mind which builds for aye."—WORDSWORTH

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EVOLUTION

Evolution, Expression, and Sensation. By John Cleland, M.D., F.R.S., Professor of Anatomy in the University of Glasgow. (Glasgow: James Maclehose, 1881.)

PROF. CLELAND is so well known as a skilled anatomist who holds some views of his own on the subject of evolution, that we are glad to welcome in this book a definite statement of what these views are. The work, moreover, is throughout very interesting. It is a collection of six essays, of which the first is on Evolution, the second on Expression, the third on Vision, the fourth on a Theory concerning the relations of Body and Mind, the fifth on Theories of the Cell, and the sixth a reprint of an address to medical students on Truth, Pathology, and the Public. These essays display a good deal of original and suggestive thinking, though not always of a kind with which we are disposed to agree.

The first essay, on the "Evolution of Organisations," expresses the view that gradual development has been the law of organic nature, but that this law has always been subservient to, or expressive of, supernatural design. After some introductory paragraphs the author clearly enough strikes his key-note thus. The fact of evolution being granted, it "may be conceived of variously, both in respect of character and cause. In its character it may be conceived of as a growth without aim, forming altogether an indefinite aggregation like the sum of the branches of a tree; or the view may be held that it is an orderly arrangement, like some vast temple in which every minaret and most fantastic ornament has got its own appointed place and harmonies, while the central tower ascends to its pre-ordained completeness.'' He then goes on to complain that "the name of Evolutionist has, with curious obliviousness, been assumed as a distinctive title by those who believe that the evolution is merely indefinite. . . . Had they called themselves Demolitionists, on account of their disbelief in morphological design, the name might possibly have been more expressive."

From this quotation the tone of the whole essay may be inferred. The essay, however, is written in the most temperate style, and by a man who certainly has a good right to be heard on all matters pertaining to morphology. We shall therefore offer a few remarks upon his general position as indicated by the above extract.

As regards the mere name appropriated by evolutionists of the naturalistic school, we cannot see that there is much ground for complaint. It is intended to signify belief in gradual development by natural causes as distinguished from sudden changes due to supernatural intervention. The name therefore has really no direct reference to any ulterior belief or opinion as to whether behind the natural causes producing evolution there is any supernatural design—provided only that this design is not supposed to display itself by breaking out into miracle, or interference with these natural causes. Therefore Prof. Cleland has quite as much right as Prof. Häckel, whom he rightly enough regards as a representative of the thorough-going "Demolitionists," to call himself an evolutionist, and we do not see that Häckel could properly deny him this right; they both believe in evolution as a process, much as they may differ in their views on all that lies behind that process. And the only reason why the term evolutionist has in many minds become identified with extra-theistic opinion, is simply because the theory of evolution has been for the most part developed by minds unfettered by any preconceived ideas on "the Method of Divine Government." If we had had to wait for the natural theologians to teach us the theory in question, Prof. Cleland's essay would not yet have been conceived. It nevertheless remains perfectly true that now when it has been conceived, written, and printed, he is as much an evolutionist as anybody else.

But when we pass from this question of mere terminology to the more important matter with which the essay is concerned, we are brought face to face with a question which it is useless in these columns to discuss. This question is whether the new light which science has shed on biology by the theory of descent is compatible with the older theory of design, and if so, to what extent. It is useless in these columns to discuss this question, because it is one upon which opinions differ, and may legitimately differ, through all points of the intellectual compass; there being here no general medium of knowledge to direct opinion, every man's judgment rests in whatever position it may be brought to rest by the particular circumstances of his temperament and education. Thus it is that to Prof. Cleland it appears most reasonable to conclude that "in the evolutions of organisation there is a non-material impulse," to which virtually we may refer all difficulties that we cannot solve in our contemplation of the natural process; while to Mr. Darwin this method of relegating any special question in science to an ultimate theory of things amounts simply to "a re-statement of the question." As a question of science no explanation is furnished by this method, and whether or not in particular cases any such explanation is possible, men of science, *as such*, must never assume, as by following the method in question they would assume, that such explanation is impossible.

Therefore, so long as men of science are watchfully careful never, as Prof. Cleland phrases it, "to make final do the duty of efficient causes," so long it matters not to science what views her individual cultivators may hold on super-scientific questions. Only it is certain that a man strongly imbued with belief in final causes is apt to incur the danger of confusing them with efficient causes, and a striking instance of this fact is displayed by Prof. Cleland himself, where he says, "If evolutions are definite, or, in other words, if morphological designs exist, the necessity for explaining *all* affinity by genetic relationship disappears." This we understand to mean that wherever affinity cannot at once be seen due to "efficient causes," we are at liberty forthwith to ascribe it to "final causes." And this presents in as bad a form as ever the doctrine which for centuries has paralysed the movements of science. If a scientific man of to-day wishes to retain his belief in "morphological design," it must be as a belief in some wholly transcendental principle with which science has nothing whatever to do. Otherwise he fails in scientific method, as for instance Prof. Cleland fails where he points to "sex and symmetry" as due to design, only because he does not see how they can be due to natural selection. It makes not an atom of difference to the logical position of science whether or not the fact of sex or symmetry, or any other fact to which any writer can point, is inexplicable by natural selection. The logical position of science is that if such facts are not due to natural selection, they must be due to some other natural causes which we may reasonably hope some day to *ascertain*. And if it is asked what is the justification of this logical position to which science has been raised, the answer is supplied by the history of science itself. Let any one go through the writings of Paley, Bell, or Chalmers, and strike out all the instances of "morphological design" which he plainly sees can now be explained by natural selection, and he must be a very dull man if he continues to repose any confidence in the residue as evidence of causes other than strictly natural. In the face of so immense an analogy the burden of proof lies with the teleologists to show that any special cases to which they may point as still requiring explanation are to be regarded as inexplicable; and this burden most assuredly is not discharged by Prof. Cleland when he seeks to strike at the heart of natural selection as a natural cause by saying of heredity that in it he "can only recognise a phenomenon the origin of which demands an explanation." No doubt this explanation is demanded but is demanded at the hands of observation and experiment—not from the cloudlands of "spirit which pervades the whole."

We have thought it well to devote the main part of this review to the essay on Evolution, because the occasion seems a suitable one to raise our voice against the pernicious habit of flirting with final causes which still lingers among a certain section of scientific workers. Let any one who so may wish continue to believe in final causes; but if he does not also wish to clog the wheels of science, let him cease to throw his final causes into any gap which the roads of inquiry may present. Science, as such, requires no *deus ex machinâ*, and those of her votaries who feel that *they* require him will best consult her interests by laying the strongest possible emphasis upon the *ex*.

The most interesting of the other essays is that on Expression. In a section devoted to "Permanent Expression," it is observed that while in many respects the physical peculiarities of permanent expression admit of being explained by obvious causes, in other respects this is not so. Thus, for instance, "a massive chin is so distinctly a physiognomic representation of firmness, that an artist would in vain attempt to exhibit the resolution of a Cromwell in a face with a small and narrow jaw, or with one of those pretty chins like a bagatelle ball, not uncommon in certain localities. . . . Yet the chin has no physical function whatever, so far as I am aware."

In a section on the "Expression of the Emotions," Dr. Cleland argues in favour of an active principle which may be defined as unconscious symbolism, and certainly in the course of a few interesting and suggestive pages he makes out a strong case. It is first shown that language serves, as it were, to stereotype a number of symbolic ideas, so that, for instance, words signifying elevation come also to signify greatness, goodness, &c., while we likewise "associate impressions derived through the organs of sense with impressions from the moral world similarly pleasant or otherwise, as in the case of sweetness, bitterness, brightness, and gloom." Such associations having become firmly established, the way is prepared for their expression by gesture; so that at last "the workings of the mind are expressed by attitudes, gestures, and movements of body of a nature correlative with them." Thus "slight movements of the arms express the hugging of an idea to the bosom when nothing but what is thoroughly impersonal is thought of, and the fingers bend as if to keep a something in the hand when nothing but delightful sentiment is conceived." And similarly the gesture of sweeping away, backwards, and downwards a repulsive object from before the eyes, "is a gesture applied to the intangible and invisible; by it the cleric puts away false doctrine, and the fastidious sublimely brands a notion as vulgar."

This theory, of which many other illustrations are given, is to some extent the same as that which Mr. Darwin calls "serviceable associated habits," seeing that the principle of association is concerned in both; but as in Dr. Cleland's theory the association need not be "serviceable," and as it is concerned with an unconsciously symbolic representation of ideas, we think with him that it deserves to be considered as a distinct theory, and we can scarcely doubt that the principle with which it is concerned has played an important part in the development of emotional expression in man.

The remaining essays, which we have no further space to consider, are likewise entertaining, and we therefore recommend the book to all who are interested in the sundry biological theories of which it treats.

GEORGE J. ROMANES

LEGGE'S "BIRDS OF CEYLON"

A History of the Birds of Ceylon. By Capt. Vincent Legge, R.A. Part III., concluding the Work. 4to. (London: Published by the Author, 1880.)

THE ornithologists are certainly active at the present time. We have just recorded the commencement of an important work on the Birds of New Guinea, we have now to notice the conclusion of an excellent volume on the Birds of Ceylon. Capt. Legge's book will, we are sure, be much valued by the numerous European residents in the coffee-districts of the island, who cannot fail to have their attention attracted by the beautiful forms of ornithic life which surround them, and as yet have had no ready means of becoming acquainted with what is known of them. Jerdon, singularly enough, did not include Ceylon in the area of his "Birds of India," and although Blyth, Layard, and Holdsworth have worked long and laboriously on the Ceylonese avifauna, their memoirs on the subject are dispersed about in various serials and other publications, which it is not possible for a coffee-planter to have at his command. A general *résumé* of the Ceylonese ornithology, with full descriptions of all the species, with excellent illustrations of the peculiar forms, and with every necessary detail required for the instruction of the local student and collector, is therefore likely to be a most acceptable piece of work to the resident in the island. At the same time Capt. Legge has produced an elaborate and scientifically exact Monograph of a local Avifauna, which will be received with welcome by naturalists of every class, and is well worthy to take its place on their shelves alongside such works as Dresser's "Birds of Europe" and Buller's "Birds of New Zealand," with which it corresponds in size and character.

As regards the general features of the Ceylonese Ornis Capt. Legge observes that the island, "although it contains none of those remarkable forms which characterise the birds of some of the Malay islands, undoubtedly possesses a rich avifauna; and, considering its geographical area (about five-sixths of Ireland), the number of species is very large. The tropical position of Ceylon, coupled with its location in the path of the monsoon winds and rains, fosters the growth of luxuriant vegetation and verdant forests, which, as a matter of course, teem with all that wonderful insect-life necessary for the sustenance of birds. Hence the large number of resident species inhabiting it; whilst the fact of its being situated at the extreme south of an immense peninsula makes it the finishing point of the stream of waders and water-birds which annually pass down the coast of India. Lastly, the prevalence of a northerly wind at the time of migration of weak-flying warblers brings these little birds in numbers to its shores."

The total number of species of birds included in Capt. Legge's work is 371, of which two have been introduced by man's agency, and about eighteen others are somewhat doubtful. The authentically determined birds of Ceylon may therefore be stated at about 350, of which forty-seven are peculiar to the island; this indicates a very large amount of individuality. The relationship of the Ceylonese Ornis, Capt. Legge tells us, is, as might have been expected from the geographical position of the island and its separation from the mainland merely by a shallow strait, "closer to that of South India than to the avifauna of any other part of the peninsula. Wallace, in his great work on the 'Distribution of Animals,' considers the island of Ceylon and the entire south of India as far north as the Deccan as forming a subdivision of the great 'Oriental Region.' It is however in the hills of the two districts, which possess the important element of a similar rainfall, where we find the nearest affinities both as regards birds and mammals; and this is exemplified by the fact of some of the members of the Brachypodidæ and Turdidæ (families well represented in both districts) being the same in the Nilghiris and in the mountains of Ceylon, while many of the Timaliidæ and Turdidæ in one region have near allies in the other.

"But though this strong similarity in the avifauna of the mountains in question, as well as their geographical characters, indicate a contemporaneous upheaval and enrichment with animal life of their surfaces, a similar connection is found between the northern parts of the island and the low country of the Carnatic.

"Here, again, we have in the fossiliferous limestones of the two regions an undoubted connection, and also an affinity in their avifaunas, which differ totally from that of the mountain-districts on either side of the straits."

In concluding our notice of this admirable volume we must not fail to call special attention to the plates which have been drawn by Mr. Keulemans, and are excellently coloured. They are devoted to the illustration of the species peculiar to Ceylon. Nor must we forget the map, which forms the frontispiece and shows the five zoo-geographical regions into which the author divides the island, besides the various localities referred to in the course of the work.

OUR BOOK SHELF

A Manual of Ancient Geography. Authorised Translation from the German of H. Kiepert, Ph.D. (London: Macmillan and Co., 1881.)

THE name of Kiepert is in itself a sufficient guarantee of the thoroughness and accuracy of a book on geography. That writer, in his "Lehrbuch der Alten Geographie"—from which the present work is abridged, though he himself describes the "Lehrbuch" as a "Werkchen"—has brought together a vast amount of well-digested information respecting ancient geography, so that the book excites the student's admiration from the grasp it displays of the many sides—geological, ethnographical, philological, historical, climatological, &c.—of that wide-reaching subject, and the discernment and critical spirit which characterise it. To the English reader the smaller work, which has been excellently translated by G. A. M., supplies a want that has long been felt. We possess no satisfactory book on the subject intermediate between primers and elaborate treatises, and the present one has all the advantage of being the condensation of a larger book, so that in reading it we feel all through that the